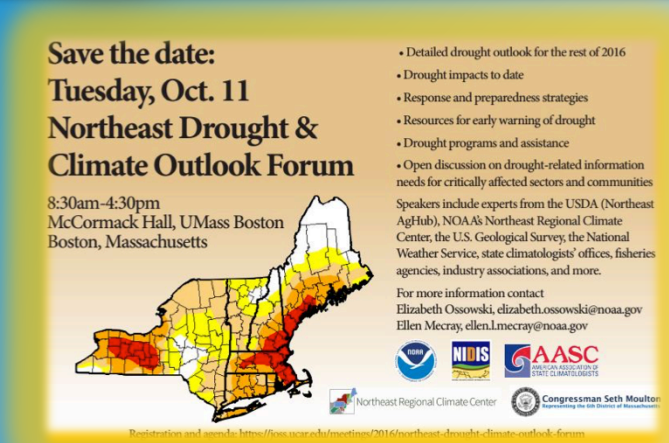
Northeast River Forecast Center (NERFC)

DOC-NOAA-NWS



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Edward.Capone@noaa.gov

Northeast River Forecast Center
weather.gov/nerfc

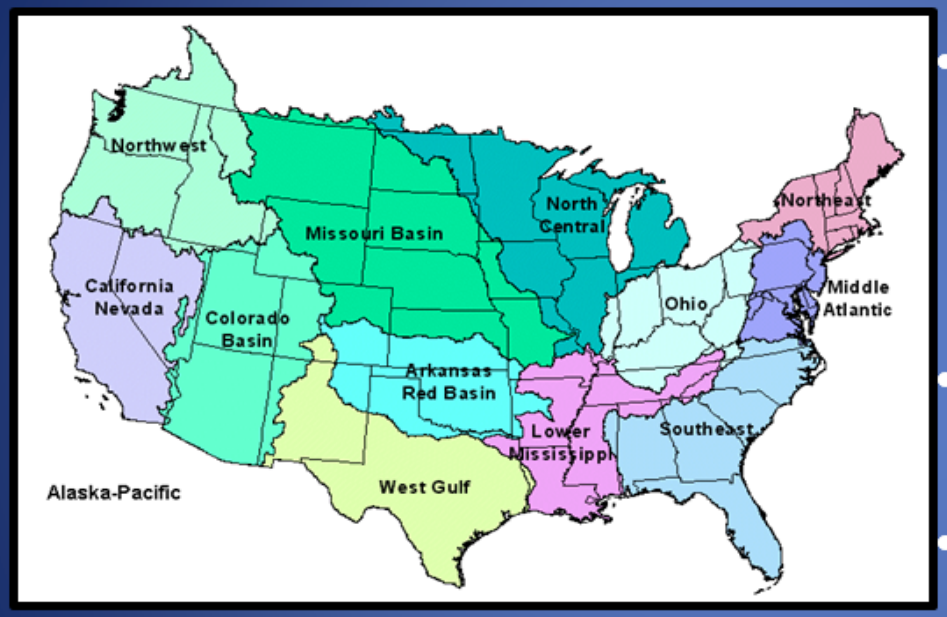
NATIONAL WEATHER SERVICE
Water and Weather Forecasting

Building a Weather-Ready Nation

Northeast River Forecast Center (NERFC)

DOC-NOAA-NWS

NWS River Forecast Centers

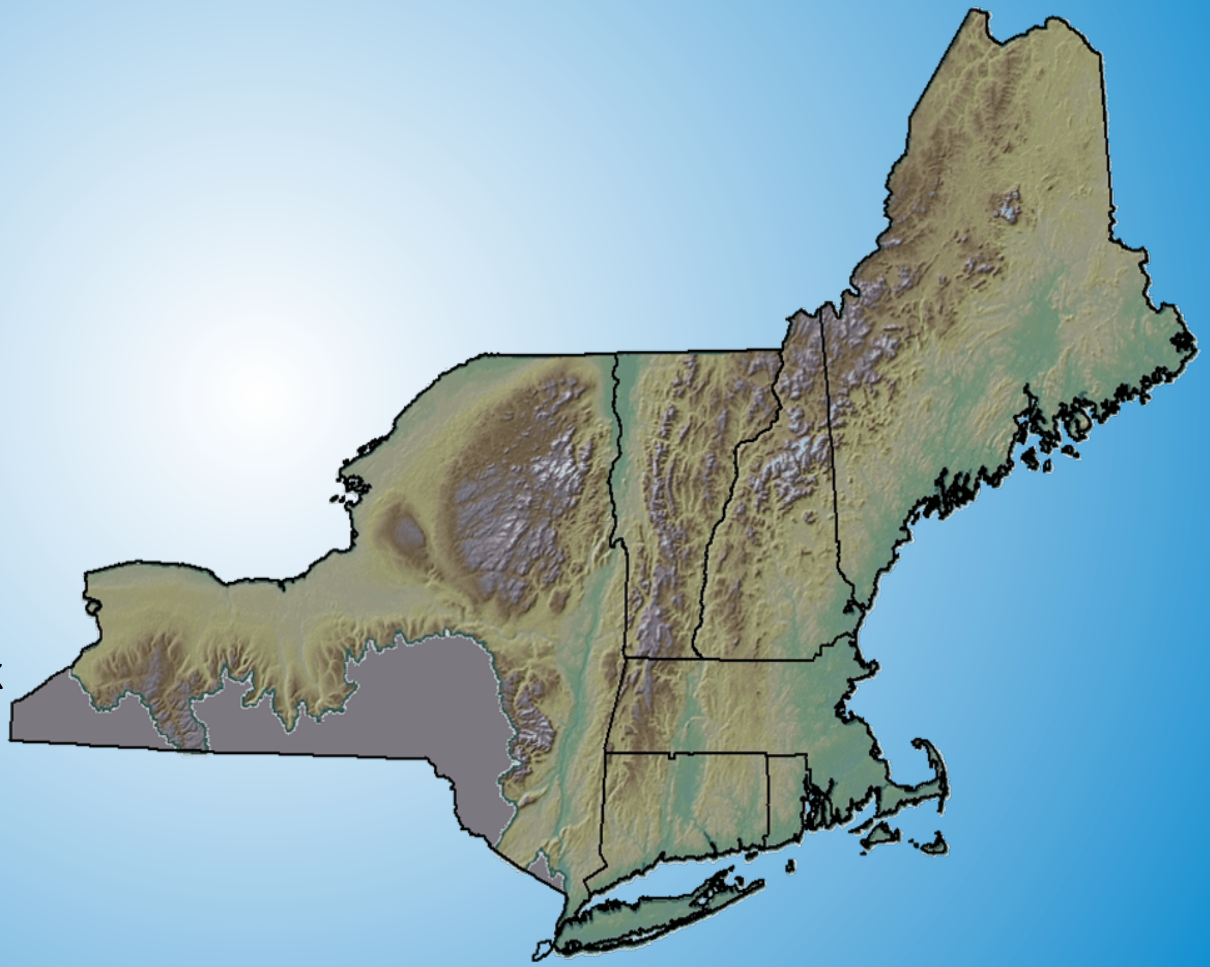


- Mission: Protection of Life and Property
  - Flood Guidance
  - Water Supply
- 13 River Forecast Centers across USA
- 122 Weather Forecast Offices

NERFC Service Area

Includes Major Storm Tracks—Ocean and Orographic Influences

- ***Major Watersheds***
- -Saint John
- -Penobscot
- -Androscoggin
- -Saco
- -Connecticut
- -Merrimack and Concord
- -Charles and Neponset
- -Blackstone
- -Taunton
- -Pawtuxet and Paucatuck
- -Hudson
- -Mohawk and Schoharie
- -Lake Champlain
- -Genesee
- -Buffalo Creeks



Monthly Water Resources Outlooks

Winter /Spring Bi-Monthly Briefings

National Weather Service

Protecting Lives and Property

NERFC Winter/Spring Briefings

➢ Next Briefing – 3/4/16

NERFC Winter/Spring Briefing
Fri, Feb 19, 2016 11:00 AM - 11:45 AM Eastern Standard Time

- **Please join my meeting from your computer, tablet or smartphone.**
  https://global.gotomeeting.com/join/369213021
- **You can also dial in using your phone.**
  United States +1 (669) 224-3319

  Access Code: 369-213-021

  More phone numbers
  Canada (Long distance): +1 (647) 497-9380

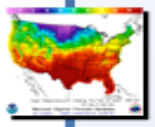
➢ **Brought to you by:**

➢ ***Edward Capone - Service Coordination Hydrologist***

➢ **Overview to Include:**

- ➢ • **Potential flood outlook – convective/synoptic conditions**
- ➢ **Stream flow-Groundwater-Soil moisture and Snow Water Equivalent conditions**
- ➢ • **Antecedent–Current—Future precipitation forecasts**
- ➢ • **Short and Medium Range Met Forecasts (especially potentially significant events)**
- ➢ • **Flood or Drought Outlook (Near term & Longer term)**
- ➢ ***Snowpack/Ice Conditions***
- ➢ ***ENSO Conditions***

➢ ***Winter/Spring Briefings occur every 2 weeks into May***



What is a Drought

Many Ways to Define It!

- **The World Meteorological Organization (WMO) defines different types of drought:**

- **Meteorological**
- **Climatological**
- **Atmospheric**
- **Agricultural**
- **Hydrologic**
- **Socioeconomic – i.e. Water supply and demand**

- ***"Drought is a normal, recurrent feature of climate, although it is erroneously considered as a rare and random event"***

Southern New England Droughts

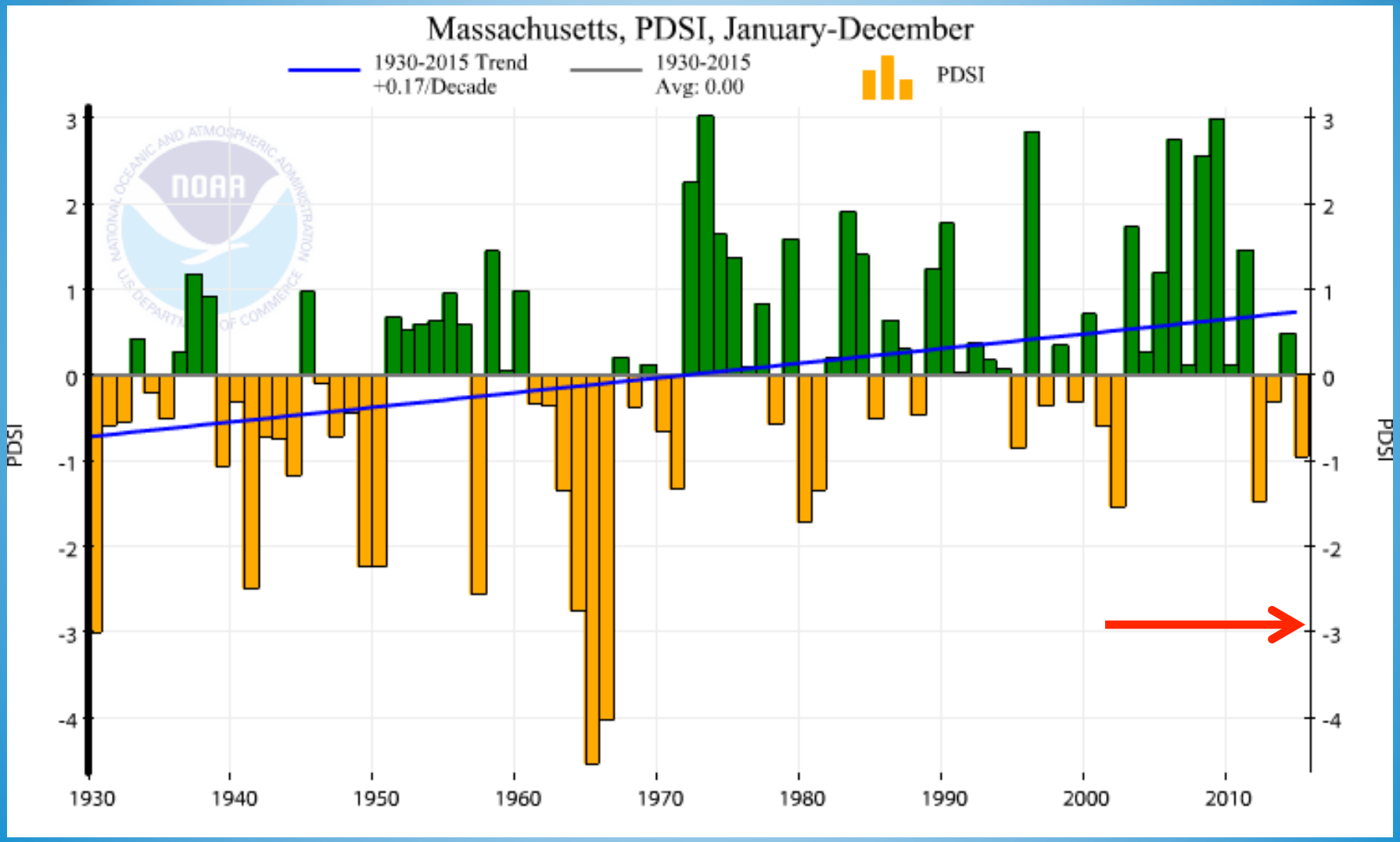
Significant Drought Episodes since the early 1900s

- **Most intense drought episodes included…**

- **1922-1923**
- **1924-1925**
- **1929-1932**
- **1939-1942**
- **1956-1957**
- **1961-1966…benchmark drought**
- **1980-1981**
- **1984-1985**
- **1999**
- **2001-2002**
- **2015-2016**

Palmer Drought Severity Index

Drought frequency has changed

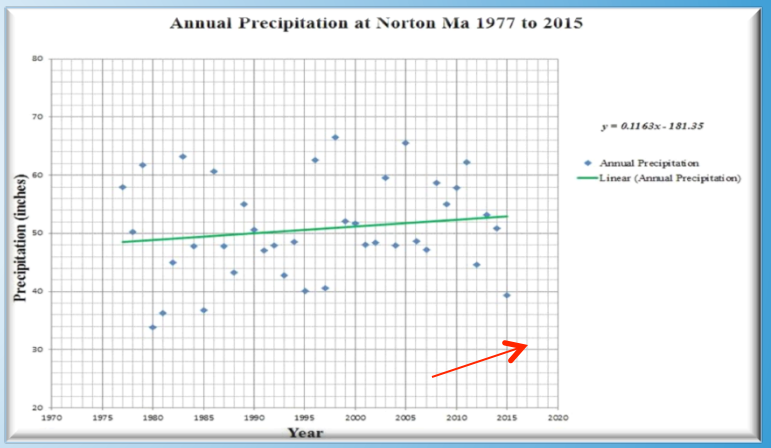


Droughts in Southern New England

Historical Perspective

- **Drought Periods are not that rare -- nearly every 10 yrs**
  > Today's drought have a "flash" behavior/rapid onset

- **1960's drought the worst in the 20th Century (100yr/500yr)**
- **Normal Precipitation 47 to 52 inches**
- **Precipitation during droughts:**
- **70 to 80 percent of normal**
- **Or 32 to 42 inches per year**



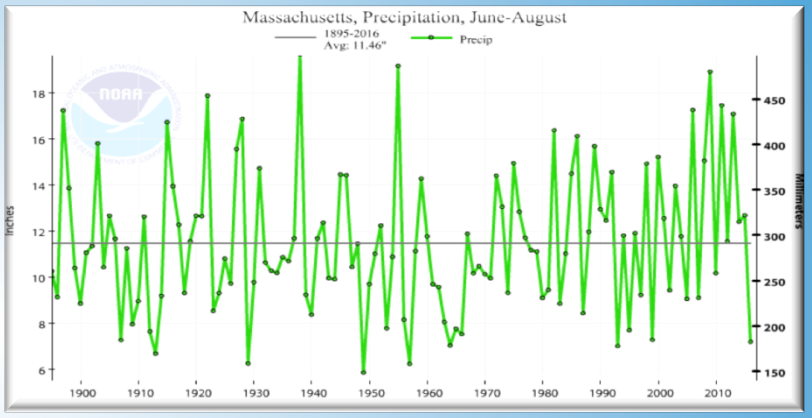
- **Temperatures above normal**
- **Most notable droughts in the past 50 years:**
- ***Ended with normal fall and winter precipitation***
- ***Ended with multiple rain events or a tropical system***
- ***Some just end as inconspicuously as they began***

Drought

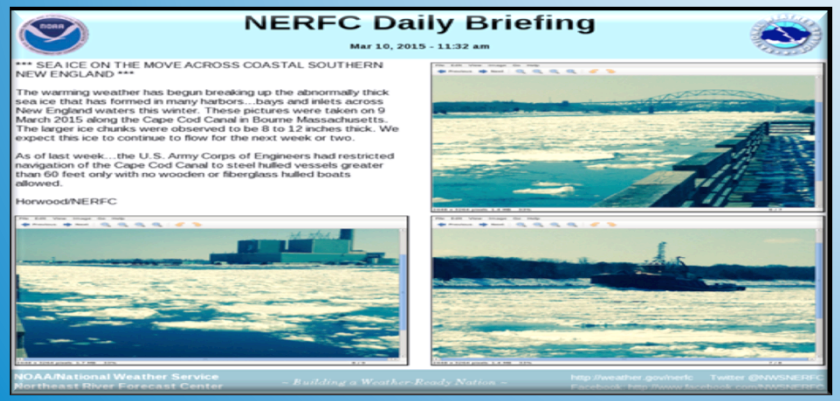
How did we get here?

- **Record "*Dry*" Snow of 2015**

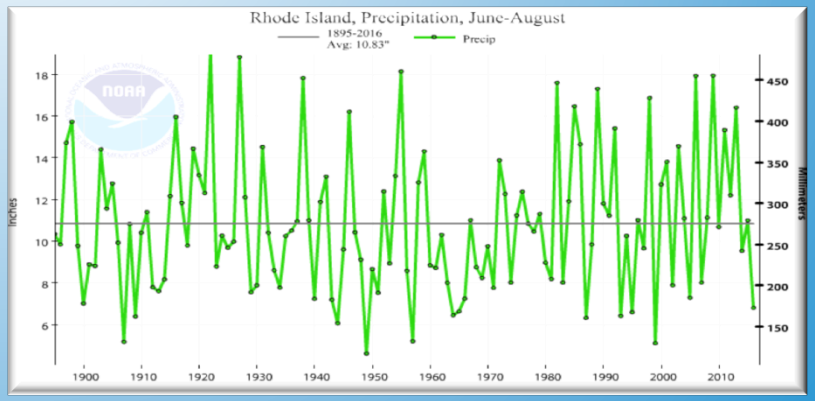
Summer 2016 Precip -- MA



- **Record Cold 6 weeks 2015**



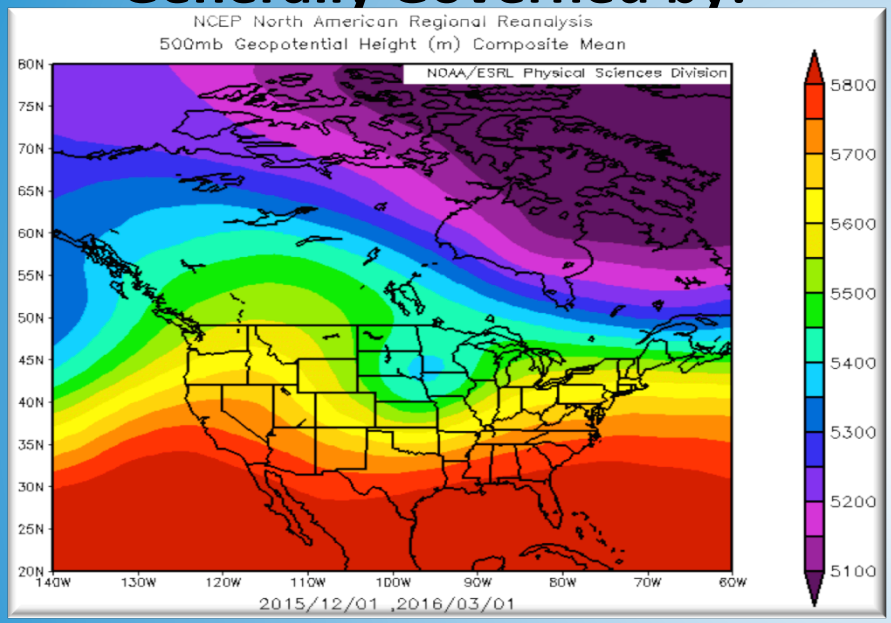
Summer 2016 Precip -- RI

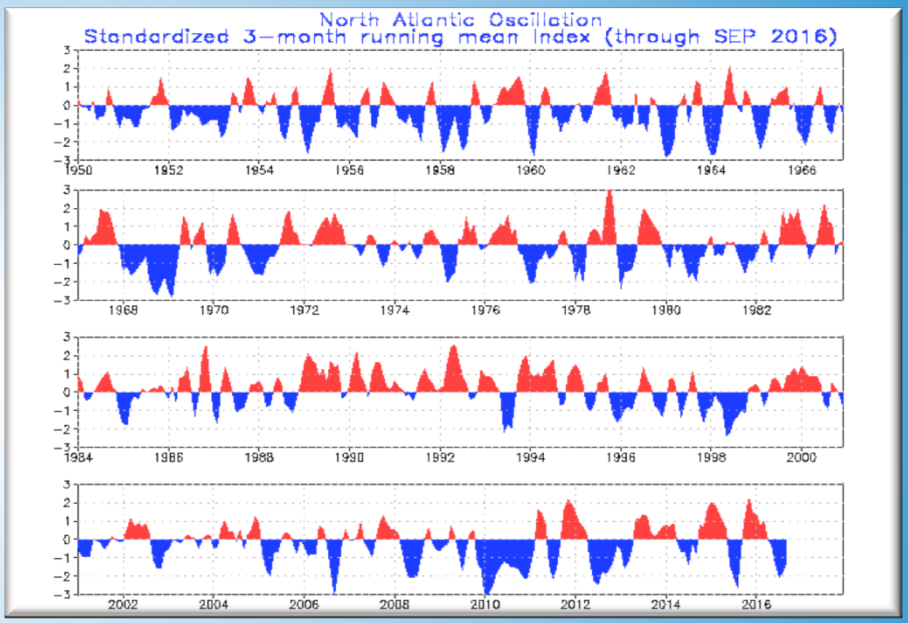


Weather Pattern

Why Drier than Normal .. Multiple Years

- **Generally Governed by:**



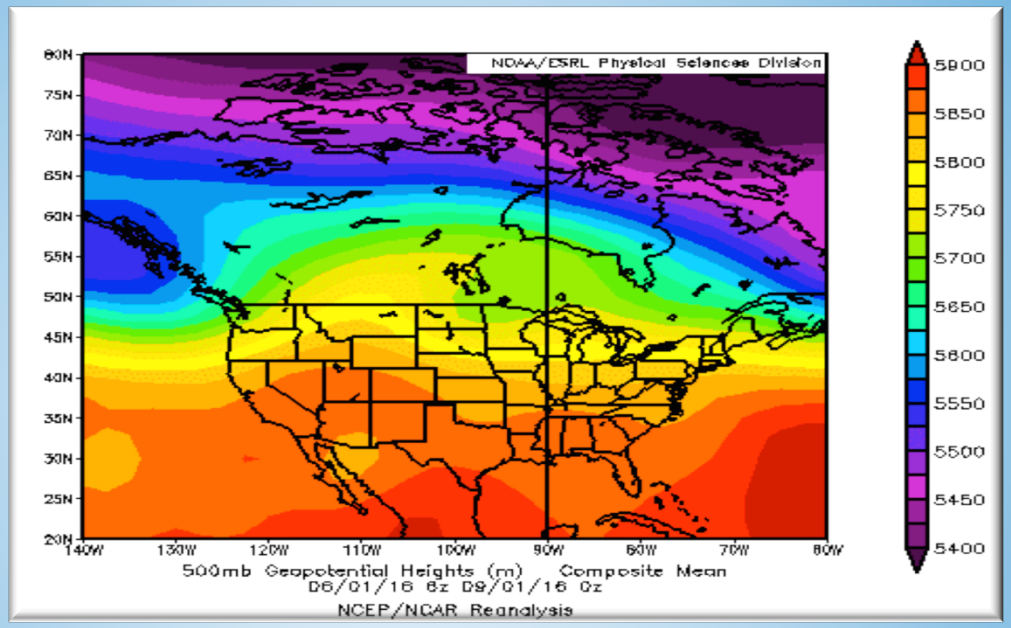


- ***Cold Season***
- **Split flow … lack of jet stream phasing near the East Coast**
- **Lack of blocking …. Positive NAO**
- **Deep Negative EPO drives Siberian Air into the NE for 2-3/2015**
- **Lack of deep moisture from Atmospheric Rivers (AR) …Atlantic…Gulf…Caribbean…Pacific connections … lack of multiple inch – 24hr precipitation events – orderly melt**
- **2015 Ocean temps limit coastal plain early convection…marine influence**

Weather Pattern

Why Drier than Normal…Multiple Years

- ***Generally Governed By:***

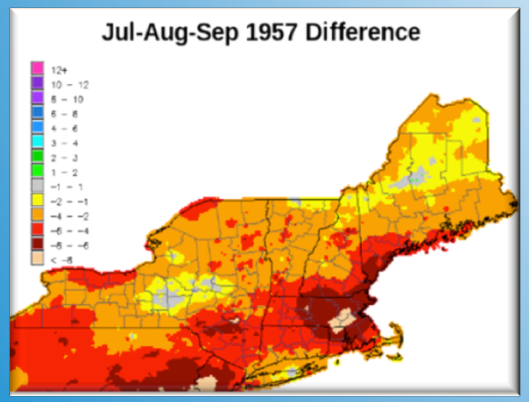


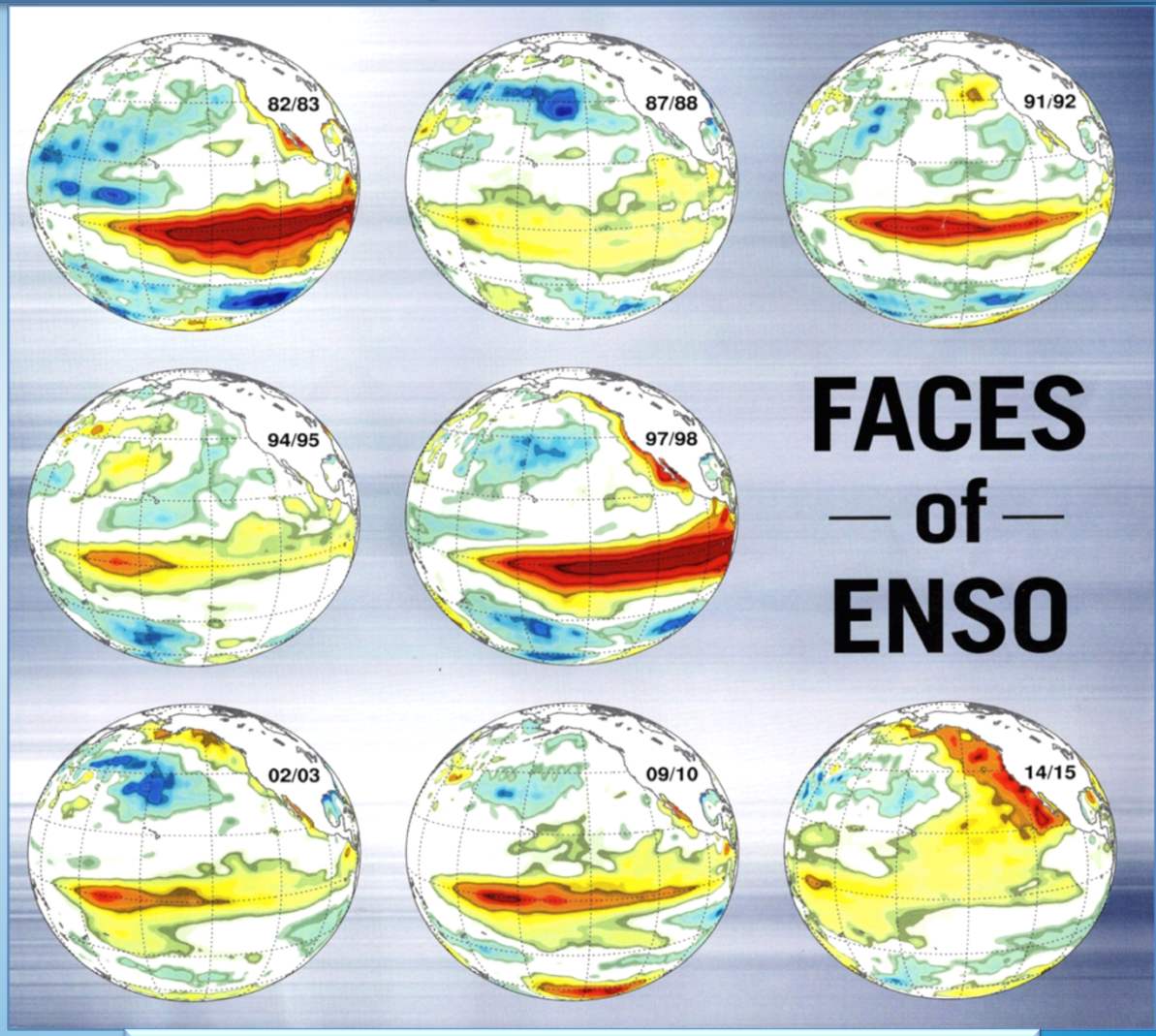
- ***Warm Season***
- **Ridging Centered West ….WNW flow over Northeast**
- **Deep Atlantic/Gulf moisture not maximizing trajectory NE (cut-off)**
- **Upper Level Confluent Flow …..yields precipitation suppression**
- **Cold Atlantic Early in Season (2015) – strengthens Marine Layer -- convection less**
- **Biggest Regional Convective outbreak occurs in February**
- **El Nino 2015-2016**

The Many Faces of El Nino

Often starts out with a dry summer/fall

- **Typically Dry Summer/ Dry Autumn Preceding**
- **Wet or Dry during Transition phase to Neutral/La Nina**





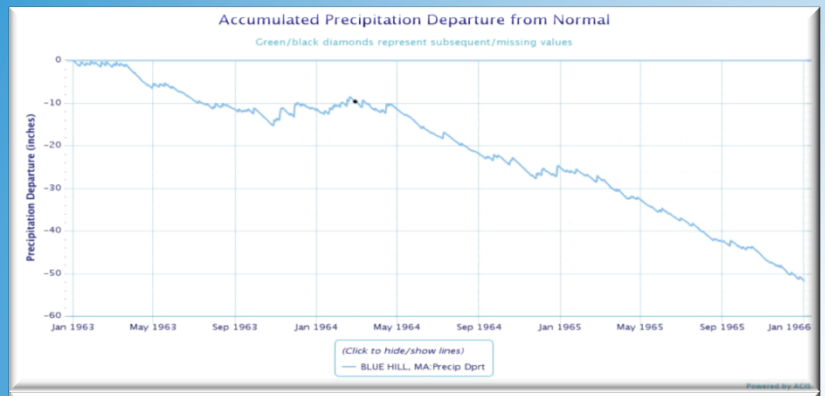
Bulletin of the AMS, vol 96, #6, June 2015

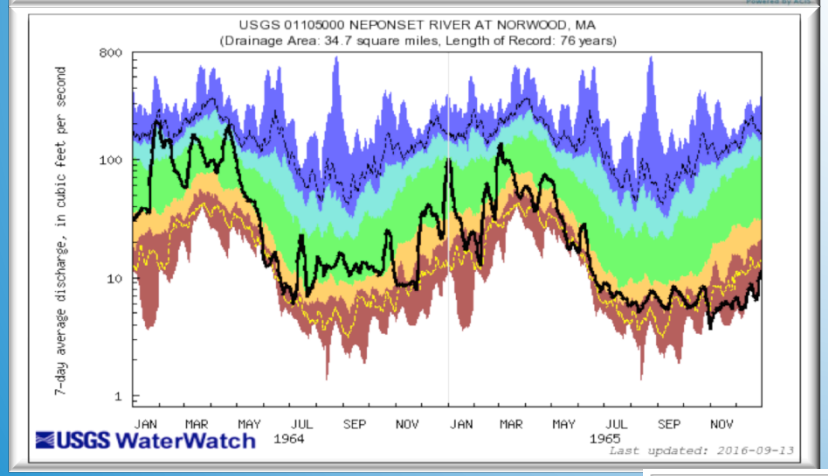
Are Flow Characteristics – Changing?

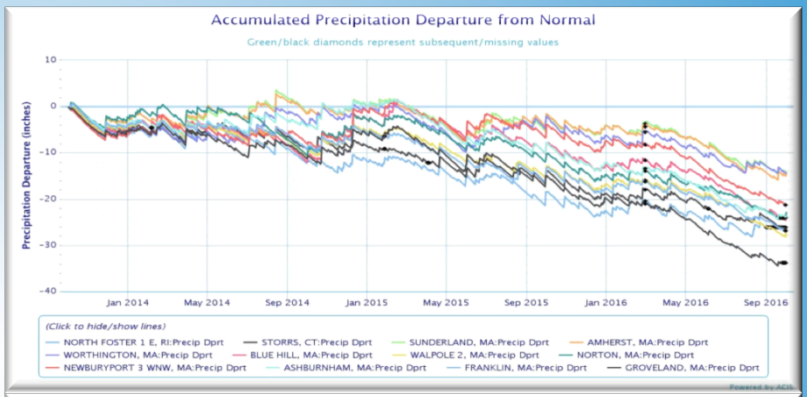
Yester-year rural-suburban to Today's Urban-Suburban

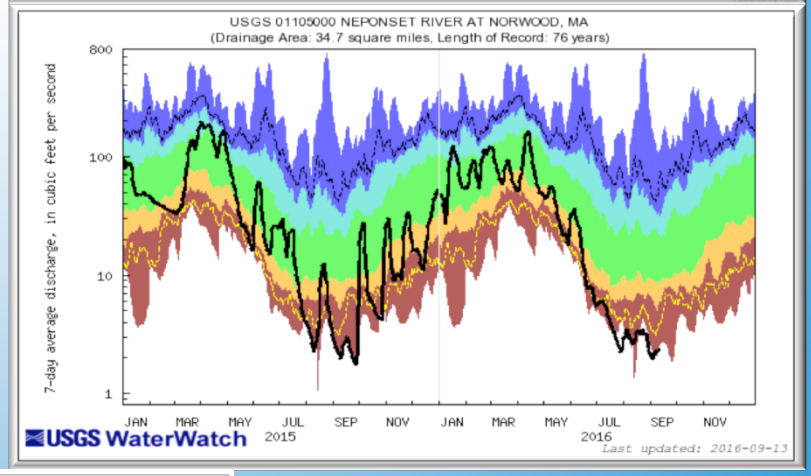
- **1960's Benchmark Drought**

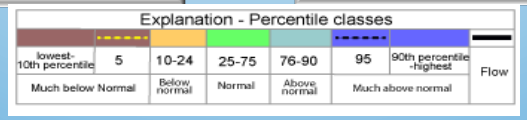
2016 Drought (2 yrs)





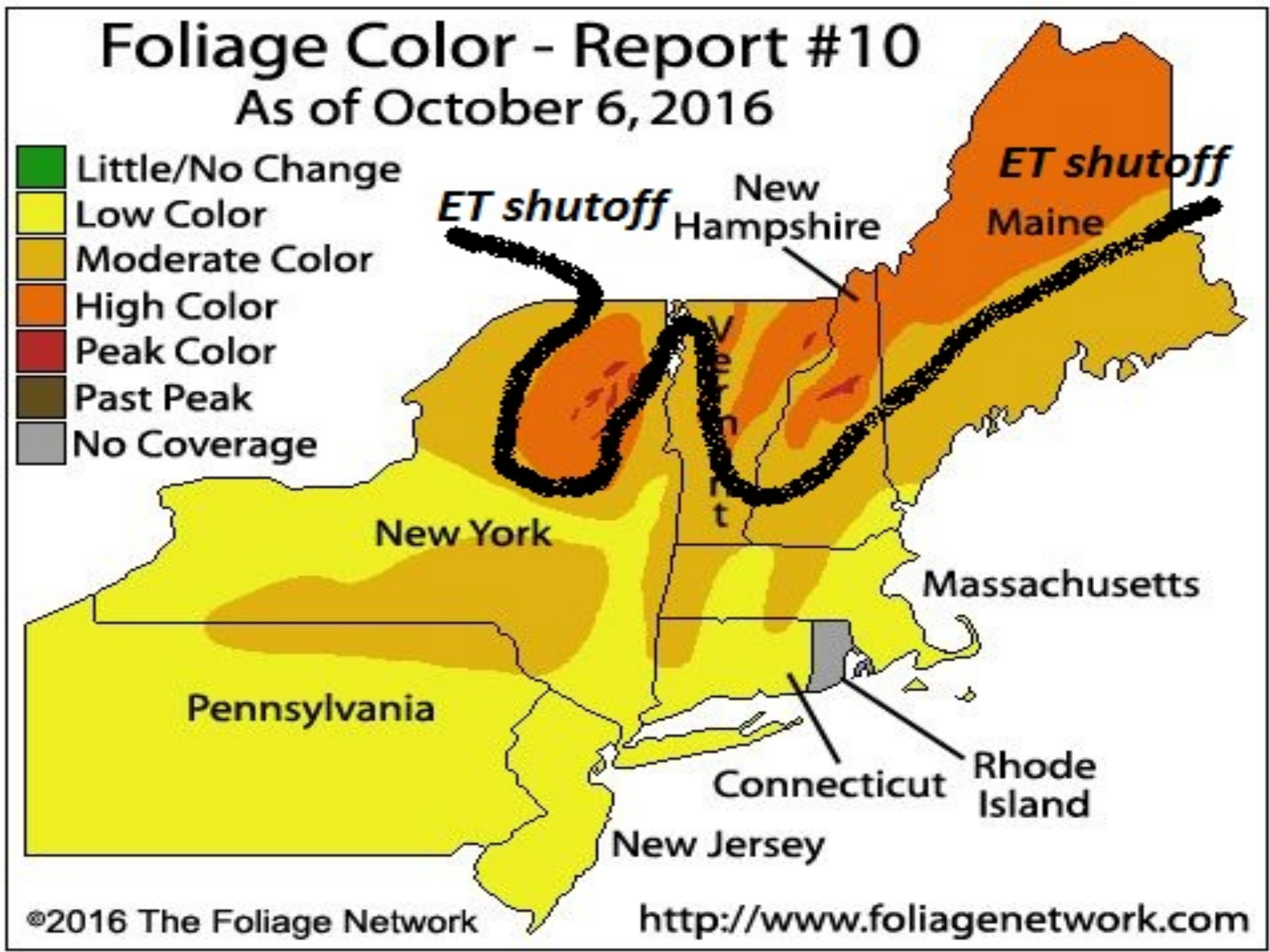






Foliage Color - Report #10

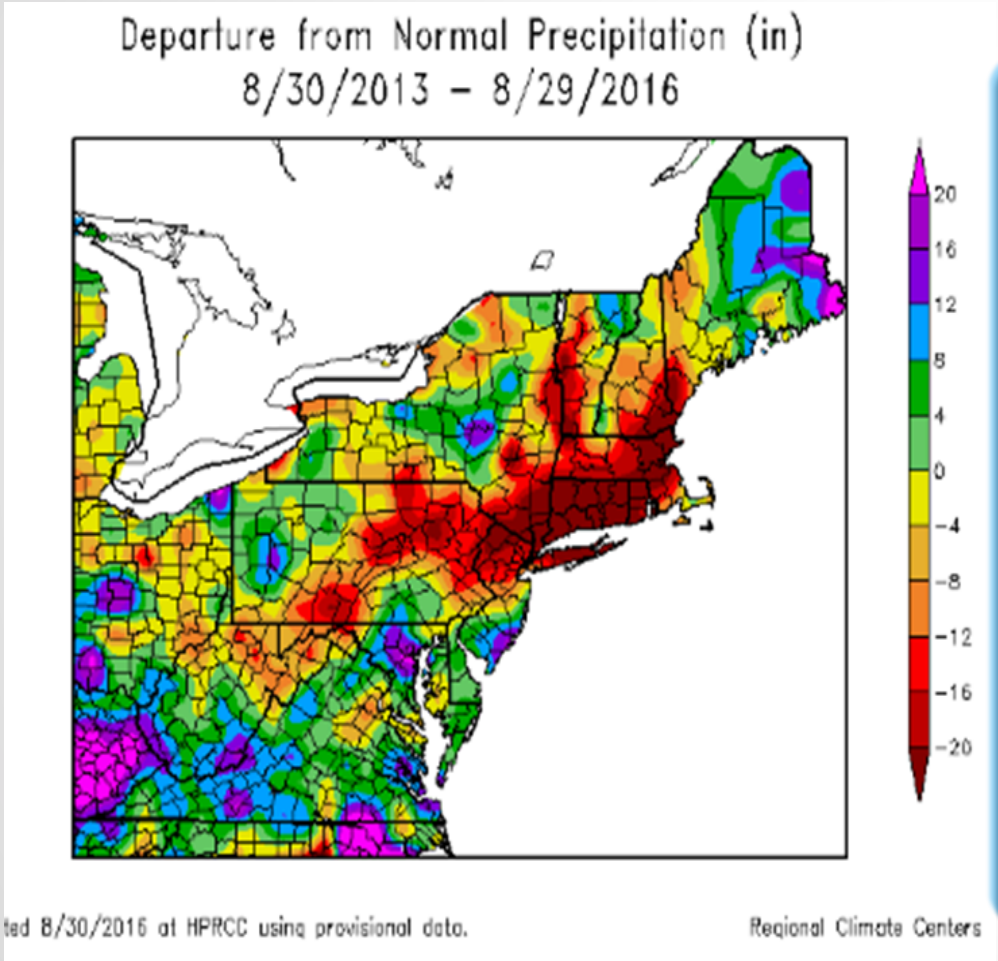
As of October 6, 2016

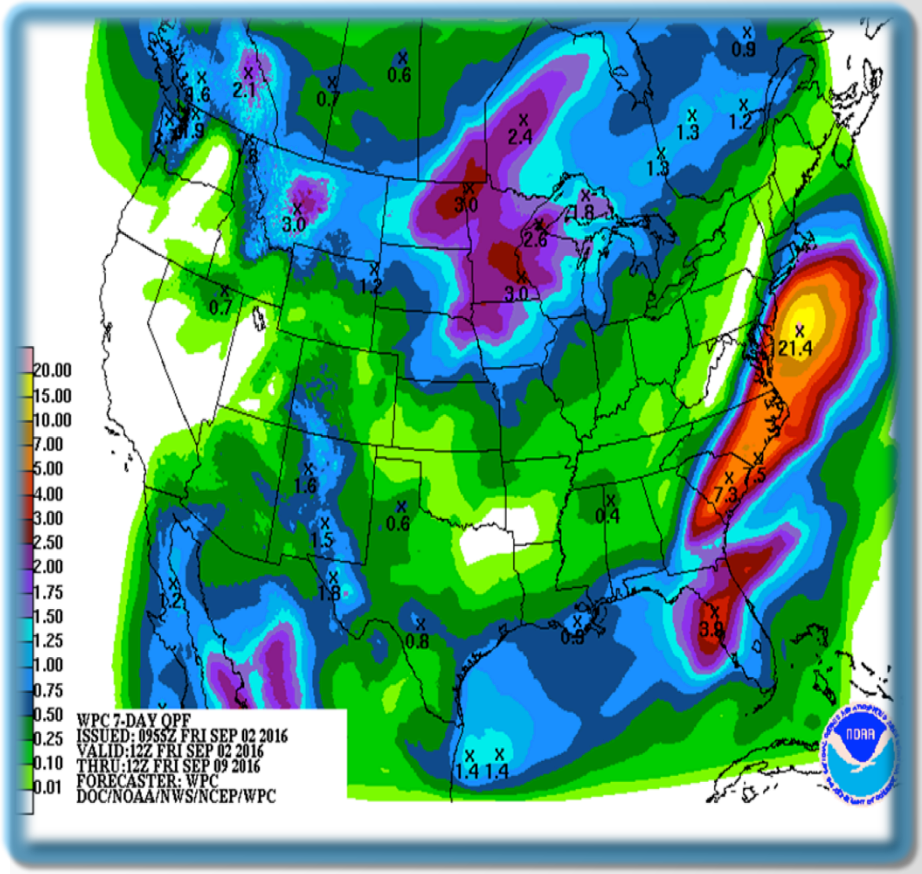


http://www.foliagenetwork.com

From Deficit to Deluge??

Do Droughts end with a Flood?





"Do Droughts end with a Flood"

Real or Folklore?

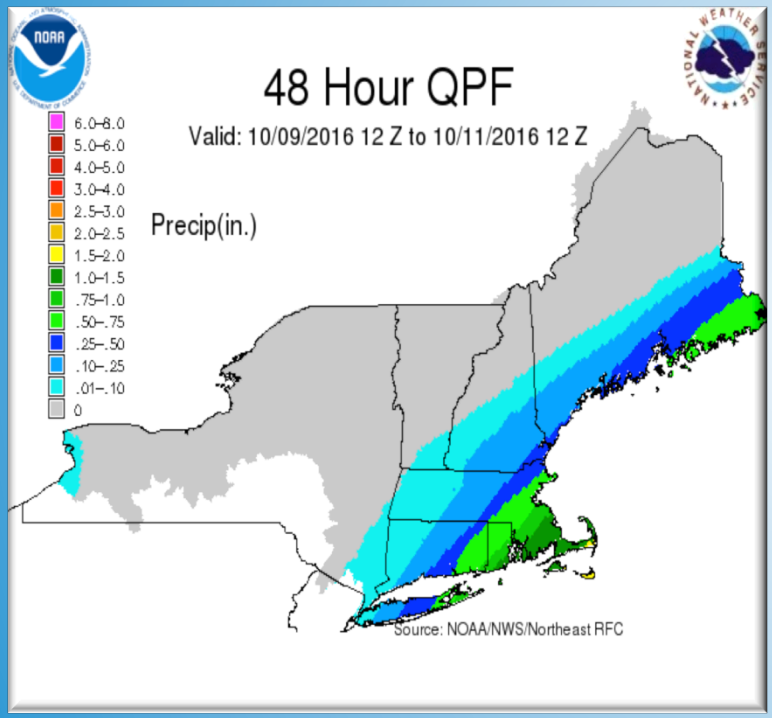
- ***Southern New England Drought Busters***
- **1961-1966 …ends with normal precip Fall of '66…heavy snows in'67 … major floods in '68**
- **1980-1981 …ends with normal Fall and Winter Precipitation during '81-'82**
- **1984-1985 …ends or nearly ends with rains late in Summer and Hurricane Gloria**
- **1999 …ends with Hurricane Floyd and earlier rains**
- **2001-2002 …bit longer of a struggle to get out of the drought**

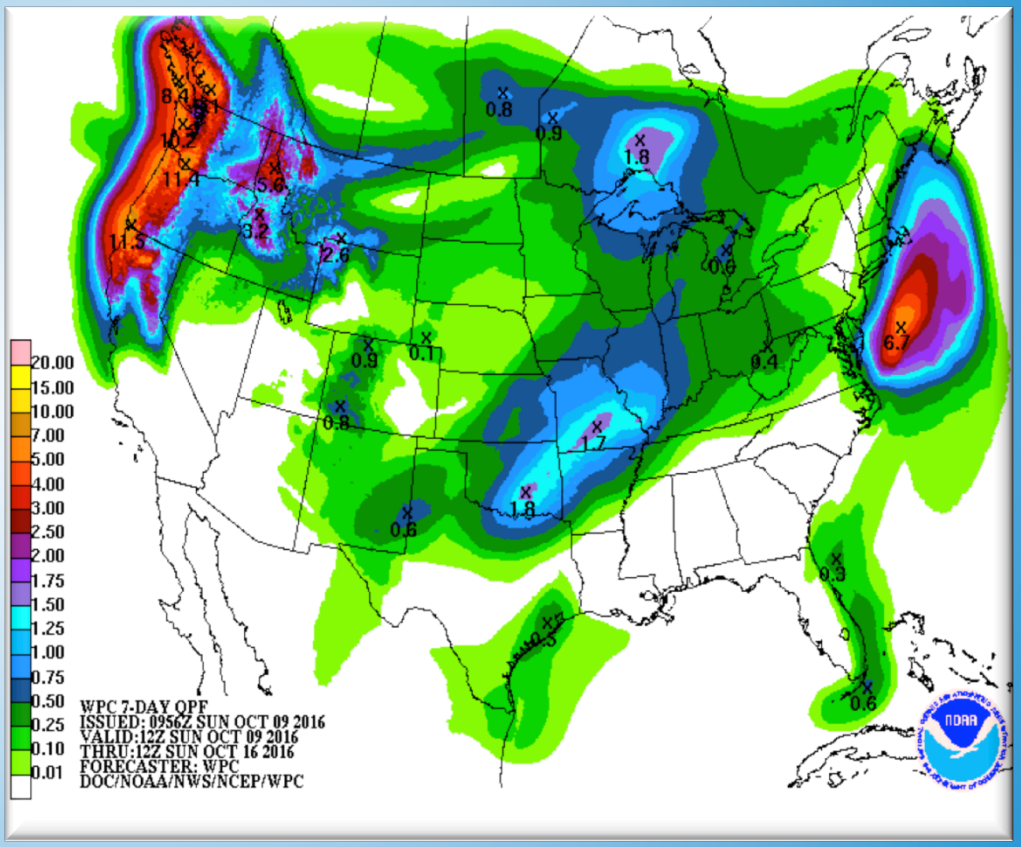
“All Droughts end with a Flood”

THE TEXAS FLOODS ARE SO BIG THEY ENDED THE STATE’S DROUGHT

Precipitation

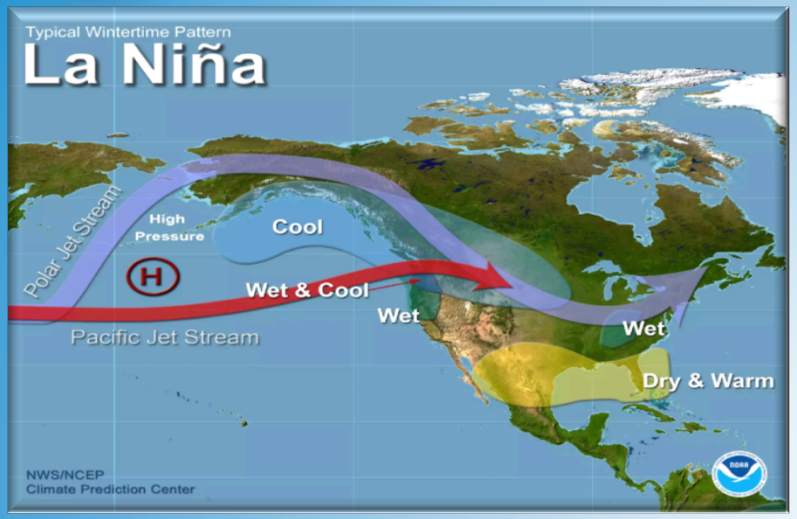
Quantitative Precipitation Forecast (QPF)

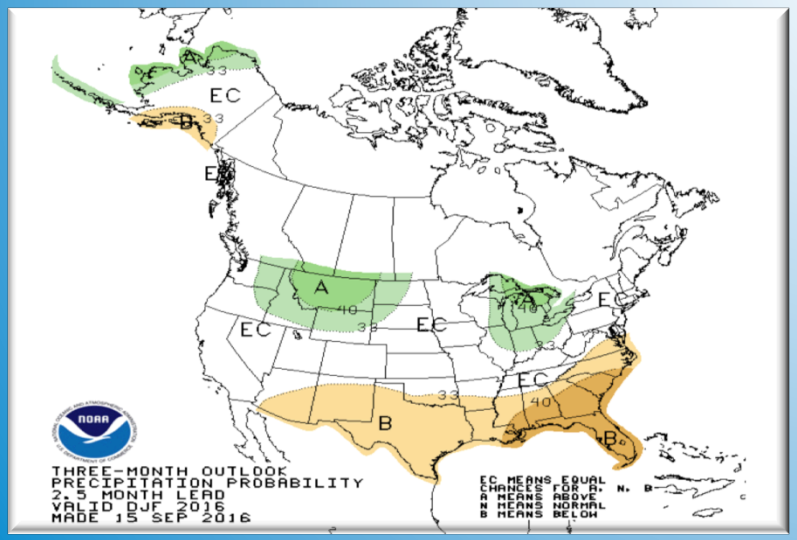




NOAA Winter Outlook

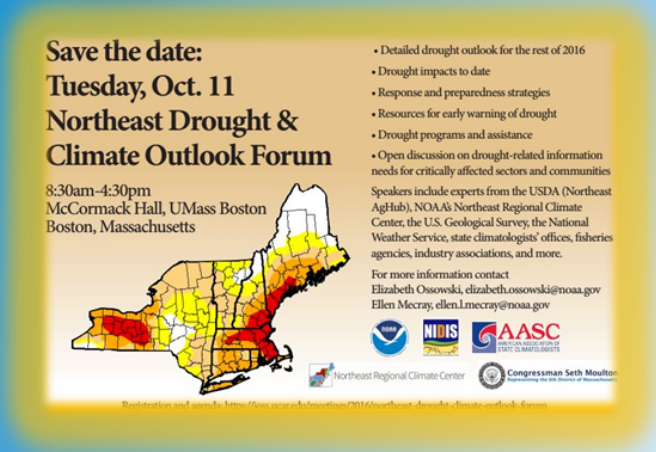
Neutral to borderline La Nina Conditions





Visit Northeast River Forecast Center (NERFC)

445 Myles Standish Boulevard Taunton, MA.



Thank you!

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